CLAIMS

1. Low-resistivity n-type semiconductor diamond characterized in containing 10^{17} cm^{-3} or more of lithium atoms and nitrogen atoms together.

2. Low-resistivity n-type semiconductor diamond as set forth in claim 1, characterized in that the lithium-atom concentration C_{Li} and the nitrogen-atom concentration C_N within the low-resistivity n-type semiconductor diamond are $0.1 \leq C_{Li}/C_N \leq 10.0$.

3. Low-resistivity n-type semiconductor diamond as set forth in claim 1 or 2, characterized in that the low-resistivity n-type semiconductor diamond is a single-crystal diamond.

4. Low-resistivity n-type semiconductor diamond as set forth in claim 1, characterized in that lithium atoms are doped into interstitial lattice sites between carbon atoms constituting the diamond, and nitrogen atoms are doped into sites where they replace the carbon atoms, with the lithium atoms and the nitrogen atoms holding arrangements that neighbor each other.

5. Low-resistivity n-type semiconductor diamond as set forth in claim 4, characterized in that the center-to-center distance between the lithium atoms and nitrogen atoms is 0.145 nm or more but 0.155 nm or less.

6. Low-resistivity n-type semiconductor diamond as set forth in claim 4, characterized in having an activation energy of 0.05 eV or more but 0.2 eV or less.

7. Low-resistivity n-type semiconductor diamond as set forth in claim 4,

characterized in having a resistivity of $10^3\ \Omega \cdot$ cm or less.

8. A method of manufacturing by a vapor synthesis technique onto a substrate low-resistivity n-type semiconductor diamond doped with lithium atoms and nitrogen atoms together, characterized in photo-dissociating a source material by photoexcitation utilizing vacuum ultraviolet light.

9. A method of manufacturing low-resistivity n-type semiconductor diamond as set forth in claim 8, characterized in that an oxide of lithium set inside a chamber is irradiated with an excimer laser beam to scatter lithium atoms from the oxide.

10. A method of manufacturing low-resistivity n-type semiconductor diamond as set forth in claim 8, characterized in that the nitrogen and carbon source materials are in gaseous form, and their supply quantities are $0.001 \leq$ nitrogen amt. / carbon amt. ≤ 0.1

11. A method of manufacturing low-resistivity n-type semiconductor diamond as set forth in claim 10, characterized in that the nitrogen source material is nitrogen gas or ammonia.

12. A method of manufacturing low-resistivity n-type semiconductor diamond as set forth in claim 8, characterized in that the wavelength of the vacuum ultraviolet light is 65 nm or more but 75 nm or less.

13. A method of manufacturing low-resistivity n-type semiconductor diamond as set forth in claim 8, characterized in that during the vapor synthesis the pressure is 1330 Pa or more but 20,000 Pa or less.

14. A method of manufacturing low-resistivity n-type semiconductor

diamond as set forth in claim 8, characterized in that during the vapor synthesis the substrate temperature is 100°C or more but 1000°C or less.